



# Soil Facts

## Using Polyacrylamide (PAM) to Reduce Erosion on Construction Sites

*Sediment and turbidity have the widest impact on water quality of any pollutants. Runoff from sites where bare soil is exposed, such as construction sites or tilled farm fields, often carries high sediment loads into receiving water bodies where some of the sediment settles, filling channels and lakes and causing habitat destruction. One approach to reducing this type of erosion is to use chemical treatments to augment seeding and mulching. The chemical polyacrylamide (PAM) is well suited for erosion control enhancement, and its use is described below.*

### Characteristics of PAM

PAM is a term describing a wide variety of chemicals based on the acrylamide and acrylate units. When linked in long chains, these units can be modified to result in a net positive, neutral, or negative charge on the PAM molecule. The positively charged, or cationic, PAMs, are not used for erosion control because they can be toxic to fish and other aquatic organisms if they spill into water bodies in sufficient concentrations. The negatively charged, or anionic, PAMs, are much less toxic to aquatic organisms and are widely used in furrow irrigation agriculture. This type of PAM is the focus of this discussion, and all references to “PAM” are to the anionic forms.

PAM is available as a crystalline powder (Figure 1), an emulsion, or a solid block or “log.” It is nontoxic to humans and to other species in the environment. One of the ingredients used to make PAM is acryamide, which is a suspected carcinogen, and as a result the PAMs available for our uses are required to have less than 0.05 percent free acryamide. This

quality control allows them to be used in food processing, drinking water treatment, and other uses where human exposure is likely.

PAM is water soluble, but dissolves very slowly and requires rapid agitation and extended mixing time. Water with more than 0.1 percent dissolved PAM is often noticeably viscous, and most PAMs have a maximum concentration of 0.5 to 1 percent in water. A good rule of thumb is to mix 1 pound of PAM per 100 gallons of water. When dry PAM becomes wet, it is very slippery and sticky and can create a slipping hazard.

### Erosion Control

The erosion process is initiated when a rain droplet impacts the soil surface and dislodges soil particles. Once overland flow begins during a heavy or prolonged rain, these soil particles are then washed downslope. It has long been known that protecting the soil by maintaining plant cover or by mulching reduces potential erosion significantly. Therefore, erosion control should always begin with protecting the soil from rain droplets and slowing overland flow by using mulch and vegetation. PAM does not directly protect soil from rain droplet impacts, but it

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